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The Dentition Method of Aging Muskrats

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Accurate and practical aging techniques are of great importance in the study of population phenomena. The aging of muskrats is made exceptionally difficult due to the fact that many young of the year taken during the winter harvest period fall within the limits of variation of the adults. This is not only true of total body lengths, tail lengths, and weights, but it is also true of skull dimensions.

Several different aging techniques have been suggested. Lay (1945) used the length of the cased pelt. The degree of overlap makes this method unreliable. Errington (1939) used the size and appearance of the internal reproductive organs. Males taken during February and March when the reproductive organs are undergoing changes with the approach of the breeding season are difficult to classify by this method. Baumgartner and Bellrose (1943) used the appearance of the external genitalia. This method is subject to the same limitations as the method suggested by Errington. The pelt-primeness method (Kellogg, 1946; Applegate and Predmore, 1947; Shanks, 1948) is a reasonably accurate and practical technique if a primeness pattern is visible. During February and March, it loses its usefulness due to the fact that a large percentage of the pelts are fully prime and therefore do not exhibit a pattern. Alexander (1951) suggested using the zygomatic breadth as an aging technique. He maintains that the amount of overlap is equally divided and hence has no effect on age ratios. Generally unequal sex ratios and the consistently smaller average size of females in all dimensions make this method of questionable value.

Gould and Kreeger (1948) working with the Louisiana muskrat

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(Ondatra zibethica rivalicia Bangs) noted differences in the appearance of the upper molars which they associated with differences in age. As the muskrat becomes older, the tooth moves from a deeper to a more superficial position. As this change occurs, the end of the fluting which was initially deep in the socket becomes visible above the bone line. Apparently these observations were not based upon known-age animals. The authors considered it a convenient and definite, though *arbitrary* method.

In our collections of skeletal material from the Valentine National Wildlife Refuge, Cherry County, Nebraska, we have 58 known-age skulls (based upon tagged animals) of *Ondatra zibethica cinnamominus* upon which this dentition method of aging is based.

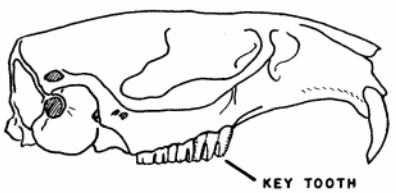

Figure 1. The adult type of molar dentition.

Twelve adults, none of which were younger than one and one-half years of age, exhibited what we call characteristic adult dentition. This adult type of dentition is illustrated in Figure 1. The first upper molar is the "key" tooth. The end of the first fluting is visible. There is also a small but discernible hump on the anterior edge of this first molar.

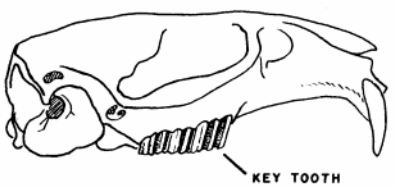

Figure 2. The subadult type of molar dentition.

Forty-six subadults ranging in age from four to nine months were examined. All of them exhibited dentition characteristics that were distinct from those of the adults. A typical example of the subadult type of dentition is presented in Figure 2. The first upper molar is again the "key" tooth. The first fluting runs deep into the alveolar socket, and

the end of the fluting is not visible. The anterior edge of the first molar is straight.

In addition to the known-aged skulls based upon tagging, 33 skulls of females that had borne more than one litter were examined. The fact that they had borne more than one litter indicates that they were definitely adult animals. They had the characteristic adult type of dentition.

This method has not yet been tested in the field on fresh specimens. It is believed that it could be used if the flesh from the side and anterior edge of the first molar was cut away with a scalpel. Its use may require further cleaning of skulls, but it will be well worthwhile since there are no satisfactory techniques available for aging muskrats taken in early spring. This dentition method of aging is also of value for aging skull collections in museums for which there is no age data of any kind.

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